

CLAIMS

1. A method for targeting an agent to a cell expressing ErbB-2 comprising bringing said cancer cell into contact with a peptide-agent complex, wherein said peptide comprises the sequence KCCYSL.
- 5 2. The method of claim 1, wherein said agent is a diagnostic agent.
3. The method of claim 2, wherein said diagnostic agent is a radiolabel, a chemilluminescent label, a fluorescent label, a magnetic spin resonance label, or a dye.
4. The method of claim 3, wherein the diagnostic agent is a radiolabel selected from the group consisting of astatine<sup>211</sup>, <sup>51</sup>chromium, <sup>36</sup>chlorine, <sup>57</sup>cobalt, <sup>58</sup>cobalt, copper<sup>67</sup>,  
10 <sup>152</sup>europium, gallium<sup>67</sup>, iodine<sup>123</sup>, iodine<sup>125</sup>, iodine<sup>131</sup>, indium<sup>111</sup>, <sup>59</sup>iron, <sup>32</sup>phosphorus, rhenium<sup>186</sup>, rhenium<sup>188</sup>, <sup>75</sup>selenium, <sup>35</sup>sulphur, technetium<sup>99m</sup>, yttrium<sup>90</sup>, lutetium<sup>177</sup>, samarium<sup>153</sup>, holmium<sup>166</sup>, bismuth<sup>212</sup>, bismuth<sup>213</sup> and actinium<sup>225</sup>.
5. The method of claim 1, wherein said agent is a therapeutic agent.
6. The method of claim 5, wherein said therapeutic agent is a chemotherapeutic agent, a  
15 radiotherapeutic agent, a toxin, a cytokine or a nucleic acid construct.
7. The method of claim 1, wherein said peptide is between 6 and about 100 residues in length.
8. The method of claim 7, wherein said peptide is between 6 and about 50 residues in length.
- 20 9. The method of claim 8, wherein said peptide is between 6 and about 25 residues in length.
10. The method of claim 9, wherein said peptide is between about 6 and 15 residues in length.
11. The method of claim 1, wherein said cell is a cancer cell.
- 25 12. The method of claim 11, wherein said cancer cell is a breast cancer cell.
13. The method of claim 11, wherein said cancer cell is a prostate cancer cell.

14. The method of claim 1, wherein said complex further comprises a linking moiety that connects said agent and said peptide.
15. The method of claim 14, wherein said linking moiety is linked to said peptide through the N-terminal amine, the C-terminal carboxyl group, or a side chain.
- 5 16. The method of claim 1, wherein said cell is located in a subject.
17. The method of claim 16, wherein said subject is a human.
18. The method of claim 16, wherein said complex is delivered local or regional to said cell.
19. The method of claim 16, wherein said complex is delivered systemically.
20. The method of claim 11, wherein said complex is delivered into vasculature of a tumor comprising said cell.
- 10 21. A method for diagnosing ErbB-2-positive cancer in a subject comprising:
- (a) administering to said subject a peptide-diagnostic agent complex, wherein said peptide comprises the sequence KCCYSL; and
- (b) assessing the amount and/or localization in said subject, of the diagnostic agent.
- 15 22. The method of claim 21, wherein said complex is delivered systemically.
23. The method of claim 21, wherein said complex is delivered to a selected body region.
24. The method of claim 21, wherein said diagnostic agent is a radiolabel, a chemilluminescent label, a fluorescent label, a magnetic spin resonance label, or a dye.
- 20 25. The method of claim 24, wherein the diagnostic agent is a radiolabel selected from the group consisting of astatine<sup>211</sup>, <sup>51</sup>chromium, <sup>36</sup>chlorine, <sup>57</sup>cobalt, <sup>58</sup>cobalt, copper<sup>67</sup>, <sup>152</sup>europium, gallium<sup>67</sup>, iodine<sup>123</sup>, iodine<sup>125</sup>, iodine<sup>131</sup>, indium<sup>111</sup>, <sup>59</sup>iron, <sup>32</sup>phosphorus, rhenium<sup>186</sup>, rhenium<sup>188</sup>, <sup>75</sup>selenium, <sup>35</sup>sulphur, technetium<sup>99m</sup>, yttrium<sup>90</sup>, lutetium<sup>177</sup>, samarium<sup>153</sup>, holmium<sup>166</sup>, bismuth<sup>212</sup>, bismuth<sup>213</sup> and actinium<sup>225</sup>.
26. The method of claim 21, wherein said peptide is between 6 and about 100 residues in length.
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27. The method of claim 26, wherein said peptide is between 6 and about 50 residues in length.
28. The method of claim 27, wherein said peptide is between 6 and about 25 residues in length.
- 5 29. The method of claim 28, wherein said peptide is between about 6 and 15 residues in length.
30. The method of claim 21, wherein said complex further comprises a linking moiety that connects said agent and said peptide.
- 10 31. The method of claim 30, wherein said linking moiety is linked to said peptide through the N-terminal amine, the C-terminal carboxyl group, or a side chain.
32. The method of claim 21, wherein said cancer is breast cancer.
33. The method of claim 21, wherein said cancer is prostate cancer.
34. The method of claim 21, wherein said patient has not been previously diagnosed with cancer.
- 15 35. The method of claim 21, wherein said patient has been previously diagnosed with cancer.
36. The method of claim 35, wherein said patient has previously received a cancer therapy.
37. The method of claim 35, wherein said patient is concurrently receiving a cancer therapy.
38. The method of claim 21, wherein said patient is at elevated risk for cancer.
39. The method of claim 21, wherein assessing comprises organ or whole body imaging.
- 20 40. The method of claim 21, further comprising excising a tumor localized by said diagnostic agent.
41. A method for treating an ErbB-2-positive cancer in a subject in need thereof comprising administering to said subject a peptide-therapeutic agent complex, wherein said peptide comprises the sequence KCCYSL.

42. The method of claim 41, wherein said therapeutic agent is a chemotherapeutic agent, a radiotherapeutic agent, a toxin, a cytokine or a nucleic acid construct.
43. The method of claim 42, wherein the therapeutic agent is a radiolabel selected from the group consisting of astatine<sup>211</sup>, <sup>51</sup>chromium, <sup>36</sup>chlorine, <sup>57</sup>cobalt, <sup>58</sup>cobalt, copper<sup>67</sup>, <sup>152</sup>europium, gallium<sup>67</sup>, iodine<sup>123</sup>, iodine<sup>125</sup>, iodine<sup>131</sup>, indium<sup>111</sup>, <sup>59</sup>iron, <sup>32</sup>phosphorus, rhenium<sup>186</sup>, rhenium<sup>188</sup>, <sup>75</sup>selenium, <sup>35</sup>sulphur, technetium<sup>99m</sup>, yttrium<sup>90</sup>, lutetium<sup>177</sup>, samarium<sup>153</sup>, holmium<sup>166</sup>, bismuth<sup>212</sup>, bismuth<sup>213</sup> and actinium<sup>225</sup>.
44. The method of claim 41, wherein said peptide is between 6 and about 100 residues in length.
45. The method of claim 44, wherein said peptide is between 6 and about 50 residues in length.
46. The method of claim 45, wherein said peptide is between 6 and about 25 residues in length.
47. The method of claim 46, wherein said peptide is between about 6 and 15 residues in length.
48. The method of claim 41, wherein said complex further comprises a linking moiety that connects said agent and said peptide.
49. The method of claim 48, wherein said linking moiety is linked to said peptide through the N-terminal amine, the C-terminal carboxyl group, or a side chain.
50. The method of claim 41, wherein said cancer is breast cancer.
51. The method of claim 41, wherein said cancer is prostate cancer.
52. The method of claim 41, wherein said complex is administered more than once.
53. The method of claim 41, wherein said complex is delivered local or regional to a tumor.
54. The method of claim 41, wherein said complex is delivered systemically.
55. The method of claim 41, further comprising administering a second distinct cancer therapy.

56. The method of claim 55, wherein said second cancer therapy is radiotherapy, chemotherapy, immunotherapy or surgery.
57. A method for rendering an unresectable ErbB-2-positive tumor resectable comprising administering to a subject having said tumor a peptide-therapeutic agent complex, wherein said peptide comprises the sequence KCCYSL.
58. A method for treating metastatic ErbB-2-positive cancer comprising administering to a subject in need thereof a peptide-therapeutic agent complex, wherein said peptide comprises the sequence KCCYSL.
59. A method for preventing recurrent ErbB-2-positive cancer comprising administering to a subject having been successfully treated for ErbB-2-positive cancer a peptide-therapeutic agent complex, wherein said peptide comprises the sequence KCCYSL.
60. A method for treating microscopic residual disease in ErbB-2-positive cancer comprising administering to a subject, following tumor resection, a peptide-therapeutic agent complex, wherein said peptide comprises the sequence KCCYSL.
61. A peptide-agent complex, wherein said peptide comprises the sequence KCCYSL.
62. The complex of claim 61, wherein said agent is a diagnostic agent.
63. The complex of claim 2, wherein said diagnostic agent is a radiolabel, a chemilluminescent label, a fluorescent label, a magnetic spin resonance label, or a dye.
64. The complex of claim 3, wherein the diagnostic agent is a radiolabel selected from the group consisting of astatine<sup>211</sup>, <sup>51</sup>chromium, <sup>36</sup>chlorine, <sup>57</sup>cobalt, <sup>58</sup>cobalt, copper<sup>67</sup>, <sup>152</sup>europium, gallium<sup>67</sup>, iodine<sup>123</sup>, iodine<sup>125</sup>, iodine<sup>131</sup>, indium<sup>111</sup>, <sup>59</sup>iron, <sup>32</sup>phosphorus, rhenium<sup>186</sup>, rhenium<sup>188</sup>, <sup>75</sup>selenium, <sup>35</sup>sulphur, technetium<sup>99m</sup>, yttrium<sup>90</sup>, lutetium<sup>177</sup>, samarium<sup>153</sup>, holmium<sup>166</sup>, bismuth<sup>212</sup>, bismuth<sup>213</sup> and actinium<sup>225</sup>.
65. The complex of claim 61, wherein said agent is a therapeutic agent.
66. The complex of claim 65, wherein said therapeutic agent is a chemotherapeutic agent, a radiotherapeutic agent, a toxin, a cytokine or a nucleic acid construct.
67. The complex of claim 61, wherein said peptide is between 6 and about 100 residues in length.

68. The complex of claim 67, wherein said peptide is between 6 and about 50 residues in length.
69. The complex of claim 68, wherein said peptide is between 6 and about 25 residues in length.
- 5 70. The complex of claim 69, wherein said peptide is between 6 and 15 residues in length.
71. A pharmaceutical composition comprising a peptide-agent complex, wherein said peptide comprises the sequence KCCYSL.
72. The composition of claim 71, wherein said agent is a diagnostic agent.
73. The composition of claim 71, wherein said agent is a therapeutic agent.
- 10 74. A kit comprising peptide-agent complex in a suitable container, wherein said peptide comprises the sequence KCCYSL.
75. An isolated and purified peptide composition comprising a peptide comprising the sequence KCCYSL and a linker molecule coupled to said peptide, wherein said linker comprises a free reactive group.
- 15 76. A method for preventing relapse of an ErbB-2-positive cancer comprising administering to a subject have been previously treated for said cancer, a peptide-therapeutic agent complex, wherein said peptide comprises the sequence KCCYSL.